

CLAIMS

1. An alarm device for internal pressure of a tire, wherein a transmitting-side module is provided inside of said tire, said transmitting-side module comprising; a sensor unit having at least a pressure sensor for detecting said internal pressure of said tire and tire rotational-movement detecting means for detecting a rotational movement of said tire; a signal-processing unit for processing signals detected at said pressure sensor and said tire rotational-movement detecting means; a transmitting unit for transmitting a tire internal-pressure information signal with a first duration through a transmitting antenna, said tire internal-pressure information signal having a tire internal-pressure data generated in and output from said signal-processing unit based on a detection signal from said pressure sensor; and a power supply for supplying an electric power to said sensor unit, said signal-processing unit and said transmitting unit; and a receiving-side module is provided at a vehicle side, said receiving-side module comprising; a receiving unit for receiving said tire internal-pressure information signal wireless transmitted from said transmitting antenna of said transmitting unit; and a signal-processing unit for processing tire internal-pressure data supplied from said receiving unit and outputting an alarm signal; characterized in that said sensor unit is operated based on a first timing signal with a first interval:

(a) if there is no second timing signal with a second interval longer than said first interval:

(a-1) when said device judges a moving of a vehicle based on a signal from said tire rotational-movement detecting means, a tire internal-pressure information signal is transmitted, said signal having said tire internal-pressure data with a start bit; and

(a-2) when said device judges a non-moving of said vehicle, the transmission of said tire internal-pressure information signal is stopped; and

(b) if there is said second timing signal:

(b-1) when said device judges the moving of said vehicle, said tire internal-pressure information signal is transmitted; and

(b-2) when said device judges a non-moving of said vehicle, N pieces of tire internal-pressure information signals are transmitted at third intervals

(N, is a natural number not less than 2), each tire internal-pressure information signal having the tire internal-pressure data with said start bit; and

wherein when a main switch of said vehicle is on, said receiving-side module is always in an operating state, and

when said main switch is off, said receiving-side module is operated intermittently at fourth intervals, each fourth interval is shorter than (N-1) times of said third interval, such that a second duration for operation of said receiving-side module is longer than said third interval.

2. The alarm device according to claim 1, wherein said third interval is determined based on an average electric field strength of said tire internal-pressure information signal.

3. The alarm device according to claim 1 or 2, wherein if there is no second timing signal and when said device judges the moving of said vehicle, the transmission of said tire internal-pressure information signal is performed at fifth intervals, each fifth interval is longer than said first interval and shorter than said second interval.

4. The alarm device according to any one of claims 1 to 3, wherein said signal processing unit of said transmitting-side module compares said tire internal-pressure to be obtained based on a detection signal from said pressure sensor, with a certain pressure; and generates the tire internal-pressure data representing that the tire internal pressure detected by said pressure sensor is out of range of a certain level.